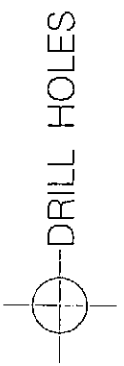
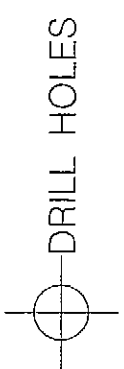


Revised: March 22, 2017



BY: Kyle

## PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE RECONSTRUCTION OF THE EXISTING TRAFFIC CONTROL SIGNAL AT THE INTERSECTION OF MD 117 (DIAMOND AVE.) AND MUDDY BRANCH RD./CHESTNUT ST. IN MONTGOMERY COUNTY. MD 117 (DIAMOND AVE.) IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION.

## INTERSECTION OPERATION

THE INTERSECTION CURRENTLY OPERATES IN A NEMA SIX-PHASE, FULLY-ACTUATED MODE WITH EXCLUSIVE-PERMISSIVE LEFT TURN PHASES FOR THE WESTBOUND DIRECTION OF MD 117 (DIAMOND AVE.) AND THE NORTHBOUND DIRECTION OF MUDDY BRANCH RD. THERE IS A RIGHT TURN OVERLAP PHASE FOR MUDDY BRANCH RD. WITH CONCURRENT SIDE STREET PHASING AND AN ALTERNATE PEDESTRIAN PHASE TO CROSS THE EAST LEG OF MD 117 (DIAMOND AVE.). THE ALTERNATE PEDESTRIAN PHASE WILL NOW INCLUDE CROSSING OF BOTH EAST AND WEST LEGS OF MD 117 (DIAMOND AVE.).

## CONTROLLER REQUIREMENTS

INSTALL EIGHT-PHASE, FULLY-ACTUATED CONTROLLER WITH VIDEO INTERFACE EQUIPMENT, 2-WIRE CENTRAL CONTROL UNIT AND ALL OTHER NECESSARY EQUIPMENT IN A BASE MOUNTED 'S' TYPE CABINET.

## APS NOTES

TO CROSS DIAMOND AVE. - NORTHEAST AND NORTHWEST CORNERS

- WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE "WAIT TO CROSS DIAMOND AT CHESTNUT, WAIT."
- WHEN WALK PHASE BEGINS, THE MESSAGE WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE

TO CROSS DIAMOND AVE. - SOUTHEAST AND SOUTHWEST CORNERS

- WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE "WAIT TO CROSS DIAMOND AT MUDDY BRANCH, WAIT."
- WHEN WALK PHASE BEGINS, THE MESSAGE WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE

TO CROSS MUDDY BRANCH RD.

- WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE "WAIT TO CROSS MUDDY BRANCH AT DIAMOND, WAIT."
- WHEN WALK PHASE BEGINS, THE MESSAGE WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE

TO CROSS CHESTNUT ST.

- WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE "WAIT TO CROSS CHESTNUT AT DIAMOND, WAIT."
- WHEN WALK PHASE BEGINS, THE MESSAGE WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE

## APS GENERAL NOTES

- PUSHBUTTONS ARE TO BE LOCATED SO THEY CAN BE ACTIVATED BY A PERSON IN A WHEELCHAIR REACHING LESS THAN 18" FROM A 60" X 60" LEVEL LANDING AREA WITH A CROSS SLOPE OF LESS THAN OR EQUAL TO 2%.
- THE 10' SEPARATION BETWEEN PUSHBUTTONS IS TO BE MEASURED FROM THE FACE OF THE PUSHBUTTON TO THE FACE OF THE PUSHBUTTON, NOT CENTER TO CENTER OF POLE.
- PUSHBUTTON ARROWS ARE TO BE PARALLEL TO THE CROSSING FOR WHICH THEY ARE INTENDED.
- LOCATION OF ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTONS MUST MEET LOCATION REQUIREMENTS OF MUTCD SEC. 4E.09 AND FIG. 4E.2 AND THE NCHRP PUBLICATION, "ACCESSIBLE PEDESTRIAN SIGNALS: GUIDE TO BEST PRACTICE". IF NOT MET, THE CONTRACTOR IS TO STOP WORK ON PUSHBUTTON LOCATION UNTIL A DESIGN WAIVER IS OBTAINED AND APPROVED BY THE DIRECTOR, OFFICE OF TRAFFIC AND SAFETY.
- ALL APS CENTRAL CONTROL UNITS SHALL BE DELIVERED TO THE SHA SIGNAL SHOP FOR PROGRAMMING AND TESTING PRIOR TO INSTALLATION. CONTACT MR. EDWARD RODENHIZER AT 410-787-7650 TO COORDINATE.

## CONTACT PERSONS FOR DISTRICT 3 ARE AS FOLLOWS:

MRS. ANYESHA MOOKHERJEE  
ASSISTANT DISTRICT ENGINEER - TRAFFIC  
(301) 513-7358

MR. TOM FOUNTAIN  
ASSISTANT DISTRICT ENGINEER - MAINTENANCE  
(301) 513-7304

MR. VICTOR GRAFTON  
UTILITY ENGINEER  
(301) 513-7350

## CONTACTS FOR OFFICE OF TRAFFIC AND SAFETY

MS. CORREN JOHNSON  
CHIEF, TRAFFIC OPERATIONS  
(410) 787-7630

MR. EUGENE BAILEY  
TEAM LEADER SIGN OPERATIONS  
(410) 787-7676

VACANT  
ASSISTANT DIVISION CHIEF,  
TRAFFIC OPERATIONS  
(410) 787-7631

MR. MIKE STOCKER  
SUPPLY OFFICE  
SIGNAL SHOP WAREHOUSE  
(410) 787-7668

MR. ED RODENHIZER  
CHIEF - SIGNAL OPERATIONS SECTION  
(410) 787-7652

**TRAFFIC CONCEPTS, INC.**  
325 Gambrills Road  
Suite B  
Gambrills, MD 21054  
(410) 923-7101  
FAX: (410) 923-6473  
EMAIL: KSCHMID@TRAFFIC-CONCEPTS.COM

M:2935

## EQUIPMENT LIST "A"

A. EQUIPMENT TO BE FURNISHED BY THE SHA AND INSTALLED BY THE CONTRACTOR

CATEGORY CODE	QUANTITY	DESCRIPTION
900000	80 SF	SHEET ALUMINUM MAST ARM / POLE / GROUND MOUNTED SIGN 3 EACH - D-3(1) (VAR X 16") DUAL FACE SIGN - MAST ARM MOUNT 1 EACH - R3-6L (30" X 36") SIGN - MAST ARM MOUNT 2 EACH - R3-5R (30" X 36") SIGN - MAST ARM MOUNT 1 EACH - R3-1 (36" X 36") SIGN - MAST ARM MOUNT 1 EACH - R3-3(2) (36" X 36") SIGN - MAST ARM MOUNT 8 EACH - R10-3(1) (8" X 15") SIGN - POLE MOUNT 1 EACH - W11-2(R) (30" X 30") SIGN - GROUND MOUNT 1 EACH - W11-2(L) (30" X 30") SIGN - GROUND MOUNT 1 EACH - W16-7P(R) (24" X 12") PANEL - GROUND MOUNT 1 EACH - W16-7P(L) (24" X 12") PANEL - GROUND MOUNT 1 EACH - R6-1R (12" X 36") - POLE MOUNT 1 EACH - R6-1L (12" X 36") - POLE MOUNT
900000	1 EA	CONTROLLER CABINET, SIZE "S" W / CTRL, VIDEO INT. 1-8 CAM

## EQUIPMENT LIST "B"

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY CONTRACTOR. ALL EQUIPMENT SHALL HAVE CATALOG CUTS SUBMITTED TO THE OFFICE OF TRAFFIC AND SAFETY FOR APPROVAL PRIOR TO INSTALLATION.

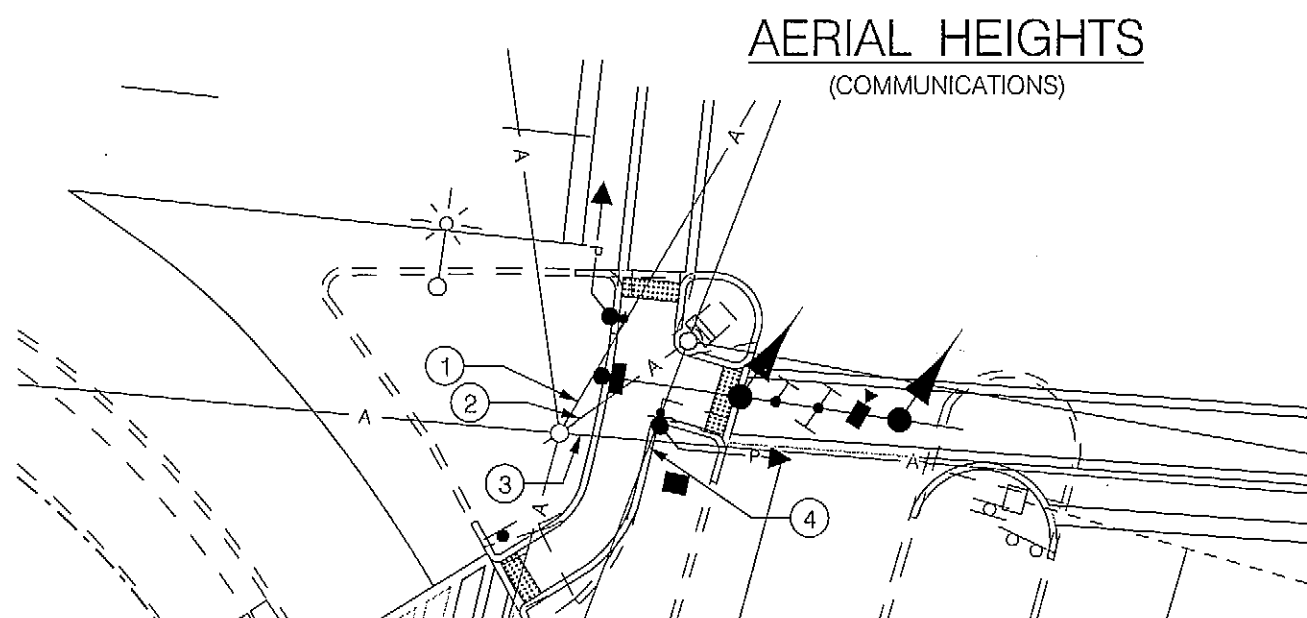
CATEGORY CODE	QUANTITY	DESCRIPTION
100000	1 EA	MAINTENANCE OF TRAFFIC
201032	336 CY	CLASS 2 EXCAVATION
203030	12 CY	TEST PIT EXCAVATION
504088	8 TON	HOT MIX ASPHALT SUPERPAVE 9.5MM FOR SURFACE, PG64-22, LEVEL-3
504314	33 TON	HOT MIX ASPHALT SUPERPAVE 19.0MM FOR FULL DEPTH PATCH, PG64-22, LEVEL-3
520109	183 SY	3 INCH GRADED AGGREGATE BASE COURSE
565617	10 LF	5 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES
585621	580 LF	12 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES
585625	145 LF	24 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES
585700	365 LF	REMOVAL OF EXISTING PAVEMENT MARKING LINES - ANY WIDTH
600000	270 LF	TYPE "A" COMBINATION CURB AND GUTTER - ANY HEIGHT OR DEPTH
600000	150 LF	TYPE "A" CURB - ANY HEIGHT OR DEPTH
665120	120 SF	DETECTABLE WARNING SURFACE FOR CURB RAMPS (TYPE 3 BRICK PAVERS)
665105	1370 SF	5 IN. CONCRETE SIDEWALK
800000	1 EA	2-WIRE APS CENTRAL CONTROL UNIT
800000	1 EA	ADJUST HANDHOLE TO GRADE AND REPLACE FRAME AND COVER
800000	8 EA	AUDIBLE / TACTILE PEDESTRIAN PUSHBUTTON STATION AND SIGN
800000	8 EA	16 INCH LED COUNTDOWN PEDESTRIAN SIGNAL HEAD
800000	3 EA	IP-BASED VIDEO DETECTION CAMERA & ANY LENGTH LEAD-IN CABLE
800000	7 EA	5 FT. OR 10 FT. PEDESTAL POLE WITH BREAKAWAY COUPLINGS, FOUNDATION & GROUND ROD
800000	1 EA	MAST ARM POLE & 38 FT. MAST ARM ANY "T" DIMENSION, FOUNDATION, AND GROUND ROD
800000	1 EA	MAST ARM POLE & 50 FT. MAST ARM ANY "T" DIMENSION, FOUNDATION, AND GROUND ROD
800000	1 EA	TWIN MAST ARM POLE & 50 FT. / 70 FT. MAST ARMS ANY "T" DIMENSION, FOUNDATION, AND GROUND ROD
800000	1 EA	100 AMP EMBEDDED METERED SERVICE PEDESTAL, CONCRETE COLLAR & GROUND RODS
800000	1 EA	REMOVE AND DISPOSE OF EXISTING SIGNAL EQUIPMENT
800000	1 EA	POLE MOUNTED SPLICE CABINET
800000	1 EA	INSTALL CONTROLLER AND CABINET BASE MOUNT (ANY SIZE) INCLUDING F&I FOUNDATION & GROUND ROD
800000	190 LF	12-PAIR COMMUNICATION CABLE (SELF SUPPORTING OR JELLY-FILLED / UNDERGROUND)
800000	240 LF	UP TO 4 IN. SCHEDULE 80 RIGID PVC ELECTRICAL CONDUIT - BORED OR SLOTTED
800000	325 LF	UP TO 4 IN. SCHEDULE 80 RIGID PVC ELECTRICAL CONDUIT - TRENCHED
800000	32 LF	WOOD SIGN SUPPORTS UP TO 4 INCH X 6 INCH
800000	80 SF	INSTALL OVERHEAD OR GROUND MOUNTED SIGN (INCLUDING ALL HARDWARE)
800000	1 EA	THIRD PARTY CONCRETE TESTING
802501	535 LF	NO. 6 AWG STRANDED BARE COPPER GROUND WIRE
810022	35 LF	ELECTRICAL CABLE 1 - CONDUCTOR (NO. 8 A.W.G.) - THIN / THWN
811001	3 EA	FURNISH AND INSTALL ELECTRICAL HANDHOLE
860284	35 EA	12 IN. L.E.D. VEHICULAR TRAFFIC SIGNAL HEAD SECTION
861105	1200 LF	ELECTRICAL CABLE 2 - CONDUCTOR (NO. 14 A.W.G.)
861107	1300 LF	ELECTRICAL CABLE 5 - CONDUCTOR (NO. 14 A.W.G.)
861108	1325 LF	ELECTRICAL CABLE 7 - CONDUCTOR (NO. 14 A.W.G.)

## EQUIPMENT LIST "C"

C. EXISTING EQUIPMENT TO BE REMOVED BY THE CONTRACTOR AND DELIVERED TO THE STATE HIGHWAY ADMINISTRATION, 7491 CONNELLEY DRIVE, HANOVER, MARYLAND 21076. THE CONTRACTOR SHALL NOTIFY THE SHA AT (410) 787-7652 AT LEAST THREE DAYS IN ADVANCE OF DELIVERY.

QUANTITY	DESCRIPTION
NONE	

ALL SIGNAL EQUIPMENT TO BE REMOVED AND NOT RETURNED TO THE SHA SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

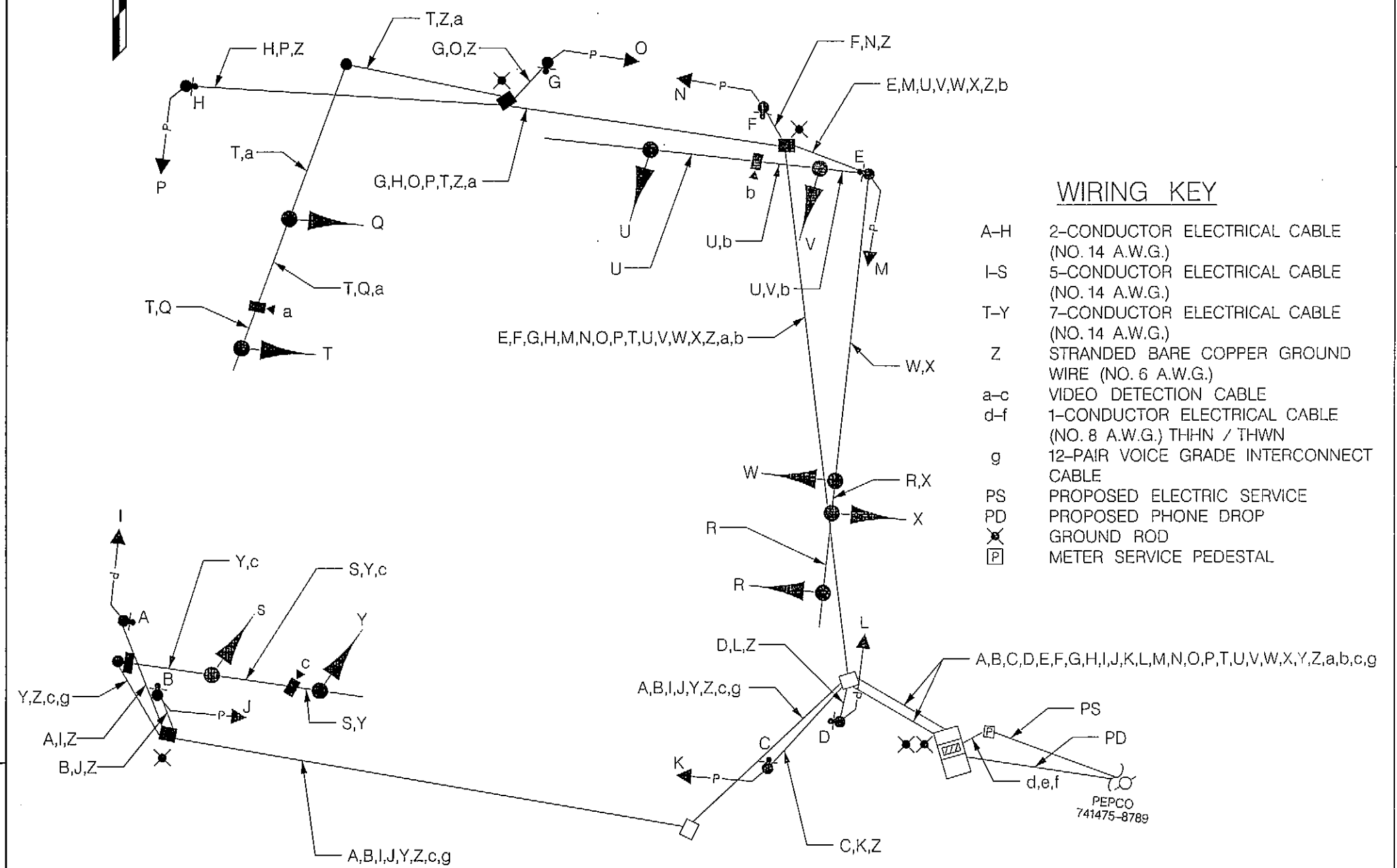


## PHASE CHART

	1	2	3	4	5	6	7	8	9	10-13	14	15	16	17
PHASE 2 & 5	R	R	G	G	G	R	R	R	R	DW	DW	DW	DW	DW
5 CHANGE	R	R	G	G	G	R	R	R	R	DW	DW	DW	DW	DW
PHASE 2 & 6	G	G	G	G	G	R	R	R	R	WK	DW	DW	DW	DW
PED CLEAR	G	G	G	G	G	R	R	R	R	FL-DW	DW	DW	DW	DW
2 & 6 CHANGE	Y	Y	Y	Y	Y	R	R	R	R	DW	DW	DW	DW	DW
PHASE 3 & 8	R	R	R	R	R	G	G	R	R	DW	DW	DW	DW	DW
3 CHANGE	R	R	R	R	R	G	G	R	R	DW	DW	DW	DW	DW
PHASE 4 & 8	R	R	R	R	R	G	G	G	G	DW	DW	DW	DW	DW
4 & 8 CHANGE	R	R	R	R	R	Y	Y	Y	Y	DW	DW	DW	DW	DW
PHASE 4 ALT. & 8	R	R	R	R	R	G	G	G	G	DW	WK	DW	DW	WK
PED CLEAR	R	R	R	R	R	G	G	G	G	DW	FL-DW	DW	DW	FL-DW
4 ALT. & 8 CHANGE	R	R	R	R	R	Y	Y	Y	Y	DW	DW	DW	DW	DW
PHASE 4 ALT. & 8 ALT.	R	R	R	R	R	G	G	G	G	DW	DW	WK	WK	DW
PED CLEAR	R	R	R	R	R	G	G	G	G	DW	DW	FL-DW	FL-DW	DW
4 & 8 ALT. CHANGE	R	R	R	R	R	Y	Y	Y	Y	DW	DW	DW	DW	DW
PHASE 4 ALT. & 8 ALT.	R	R	R	R	R	G	G	G	G	DW	WK	WK	WK	WK
PED CLEAR	R	R	R	R	R	G	G	G	G	DW	FL-DW	FL-DW	FL-DW	DW
4 ALT. & 8 ALT. CHANGE	R	R	R	R	R	Y	Y	Y	Y	DW	DW	DW	DW	DW
FLASHING OPERATION	FLY	FLY	FLY	FLY	FLY	FLR	FLR	FLR	FLR	DARK	DARK	DARK	DARK	DARK



## WIRING DIAGRAM



## INTERCONNECT NOTE:

1. DISCONNECT INTERCONNECT FROM EXISTING MONTGOMERY COUNTY SPLICE BOX AND RE-ROUTE TO THE PROPOSED SPLICE BOX LOCATED ON THE NEW MAST ARM POLE.



STATE OF MARYLAND  
DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION  
OFFICE OF TRAFFIC & SAFETY  
TRAFFIC ENGINEERING DESIGN DIVISION  
MD 117 (DIAMOND AVE.) & MUDDY BRANCH RD./  
CHESTNUT ST.  
GAITHERSBURG, MARYLAND

## GENERAL INFORMATION PLAN

SCALE AS SHOWN DATE 8-22-2013 CONTRACT NO. XY2395185

DESIGNED BY J.K. SCHMID COUNTY MONTGOMERY  
DRAWN BY M. ROSEN LOGMILE 15011712.17  
CHECKED BY T.ZAYDEL TIMS NO. M055  
F.A.P. NO. - TOD NO. -

DRAWING NO. TS-2399A GH-2 SHEET NO. 3 OF 3

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 26233, EXPIRATION DATE: 8/22/2017

PLOTTED: Thursday, August 22, 2013 AT 03:26 PM  
FILE: Z:\28001\2805 - BRUDIS & ASSOC\Task 1551\Signal\6-17-13 muddy\_branch.dgn